# Improving the Utah Transportation Data Model

Posted by Bert Granberg - 2009/01/06 08:08

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Out of the the Utah Geospatial Infrastructure (UGI) strategic planning process came a clear mandate to develop and refine Utah GIS data models.

The Utah Transportation Data Model (UTDM) has been around for years now. Although it currently contains 48 attributes, there are several modifications that have been requested.

Here is my list of UTDM enhancement recommendations (below). Please feel free to use the forum to add to my list.

Attribute Additions:
- Number of Lanes
- Min and max clearance heights
- Weight restrictions
- Median Type, physical u-turn restrictions
- UDOT Milepost From/To for state/federal (class A) routes
- Better compatibility with e911/CAD systems
- Scenic byway/backway designation
- Local (city/county) cartographic code
- Seasonal or weather closure
- Replication global identifier and/or persistent unique feature identifier
- 4WD recommendations
- Vertical level attribute for cartography
- Detectors & dynamic signposts

Geometric Guidelines:
- Divided highways (when to represent each direction separately?)
- Single Point Urban (freeway) Interchanges (SPUIs) (how to represent?)
- Driveways/private roads/service entries (when is it a street)
- Agreement points at county, state boundaries

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# Re:Improving the Utah Transportation Data Model

Posted by Kevin Bell - 2009/01/06 09:46

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Bike Lanes?
Slope (or max slope)?
Annual Average Daily Traffic?
Center lane type: turn lane or not? (an attribute of Median Type?)

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# Re:Improving the Utah Transportation Data Model

Posted by Steve Gourley - 2009/01/06 11:23

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this may seem simple or already an attribute but a way to determine one way streets and their flow direction.  And what about speed limit?  It'd also be pretty neat to track the number of car accidents on a certain road as well as wildlife accidents.

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# Re:Improving the Utah Transportation Data Model

Posted by Bert Granberg - 2009/01/06 11:56

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Speed limit and One Way are currently handled by the data model although they are not currently complete or QC'ed at a statewide level. These attributes are needed for any hope of doing decent network analysis.

Integrating UDOT's milepost systems will allow for accident data already tracked by UDOT (cars v. cars; cars v. themselves; and cars v. wildlife) to be analyzed geographically.

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## Re:Improving the Utah Transportation Data Model

Posted by James Wingate - 2009/01/06 15:34

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I don't have any additional fields to add, but I do recommend that the metadata include an explanation of how to populate the fields. Most are self-explanatory but a few are not. Consistency in how alias names are used is a prime example.

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## Re:Improving the Utah Transportation Data Model

Posted by Jessica Kirby - 2009/02/23 14:37

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Would it be too much trouble to add the  width of the road (like a right and left of center line) if known?

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## Re:Improving the Utah Transportation Data Model

Posted by Bert Granberg - 2009/03/02 09:45

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Will keep that in mind...my only question is who would have and maintain that detail and not do it with polygons?

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## Re:Improving the Utah Transportation Data Model

Posted by Jessica Kirby - 2009/03/02 09:58

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That's a good question. I posted my comment with hopes of getting others reactions/ to spark a conversation about it. I am not even sure if it would be worth pursuing or if it is a reasonable request?...we'll have to see if anyone has anything to say about it.

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## Re:Improving the Utah Transportation Data Model

Posted by James Wingate - 2009/03/02 10:07

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I support having a model with minimal attributes so that is as easy as possible for the data creators to maintain. Thus, I recommend determining which are the core attributes and which are the extras. To me, width is an extra.

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## Re:Improving the Utah Transportation Data Model

Posted by Jessica Kirby - 2009/03/02 10:39

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Thanks for starting the discussing James...

I do understand the need to keep it simple. But entertain my idea for just a moment...coming from a surface land management point of view, I see value in the "extras" if they are not to cumbersome to maintain. If an extra attribute, such as width, was available the information could be used for verifying and maintaining the underlying ownership layer. In a way, allowing the two layers could co-exist in harmony:) It makes sense to me to because the two layers should be coincident. One being the base for the other.

I see this improvement as our opportunity to look a little outside our data model boxes and  to collect information about transportation that we may not have thought valuable in the past. Who knows, maybe the transportation users would also find the information useful.

Of course, this all depends on the availability of the information and the willingness from transportation data model team

to populate it.  Not being a transportation person myself, I don't even know if this is a reasonable request...although in talking with Kevin Sato, Cottonwood Heights City, they do maintain such a field and find it useful.

I may be mixing to much fruit in one basket here (i.e trying to update surface ownership from the transportation data layer)but it's my way of killing two birds with one stone.

That's my 2 cents on the topic.

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## Re:Improving the Utah Transportation Data Model

Posted by James Wingate - 2009/03/02 11:06

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Interesting... Perhaps road width could help with land ownership and parcels if those layers are all coincident. One obstacle may be if width is populated in terms of how wide the street is actually built vs. how wide the road right of way is. As I'm sure you know, roads are often not initially built to the full width of their right of way, but may be widened later as traffic needs dictate. This may present a problem with having the boundaries be concident. Just a thought.

Back to my first concern--I don't have objections to any field being included in the model if the creators already have the data. But I think asking them to populate fields that they don't normally use creates additional work for them, which may result in them being resistant to cooperating with the agreed-upon data standards (once they're agreed-upon).

Thus, I think we need consensus among the data creators and data users about which fields are needed the most to maximize support for the standard. Thanks.

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## Re:Improving the Utah Transportation Data Model

Posted by Kevin Bell - 2009/03/02 11:13

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Hi gang!  We maintain width attributes, but the data reflects pavement widths, so if there's an island then that's not accounted for.

I say James is right on the minimal required data, and Jess is correct that the more data the better.

One request that we've had that involves this width attribute is from the movie producers.  They'd like to know if they can get their trucks around town, so they're also interested in overpass height restrictions, bridge weight max, etc.

Everybody's 2 cents is adding up to quite a bit here!

Maybe Bert could start a list here somewhere that would document the requests...  so far here's mine:

width
center lane type
bike facility type
overpass height restriction
bridge weight restriction
truck route hazmat restriction
    can I haul plutonium on this street?
ATV allowed (some small towns allow ATVs)
U Turns allowed?
Accident rate (N per 100 million veh miles traveled)

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## Re:Improving the Utah Transportation Data Model

Posted by Jessica Kirby - 2009/03/02 11:37

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I am aware of the differences of right of way and actual construction surface, good point! This is where the idea could be tricky. There is also the issue of perpetual easement across land vs actual physical ownership. And then there's the point that Kevin just brought up; the method in which the widths are measured and how that in itself will vary.

The collaborator issue should not be taken lightly.  Collaborator involvement is a real concern (i.e. we must have it)and I understand that if we make the model to involved then there is the potential to loose participation.  If this attribute, and others as Kevin mentioned, are adopted into the model there is always the possibility that could be seen as "Bonus" with the intent to populate when information is available and with hopes of filling in the holes when funding and time allows.  Or will we, by allowing nonpopulated attributes, be introducing clutter to the data model?

My 2 cents may add up to a few dollars by the time this is done :)

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## Re:Improving the Utah Transportation Data Model

Posted by Bert Granberg - 2009/05/11 13:49

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Two more attribute fields suggestions that thrown out there...

- whether or not addresses on the feature are official or not....i.e. approved by the city or county. OffclAdd?

- attribute field to track exceptions to the standard mixed parity address ranges. MxParExcpt?

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## Re:Improving the Utah Transportation Data Model

Posted by Joe Borgione - 2009/05/12 12:17

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We are pretty lucky here in Utah that putting address ranges on a street can be checked by the numeric values of the cross streets.  Of course between 100 South and 200 South on State St there are not 100 officially addressed structures, but what is the the address (official or other wise) of the semiphore in the intersection of 100 S and State as well as 200 S and State?

There are plenty of activities and features associated with intersections; accidents, signage, crosswalks, manholes, etc.  Would you really want to limit the address range of a street to the actual or official numbers at the expense of these other objects?

For streets, ranges work; for precise/official addresses, look at parcels or survey-grade GPS the addresses with some standard, like where the driveway meets the street or the front door...

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## Re:Improving the Utah Transportation Data Model

Posted by Bert Granberg - 2009/08/06 13:35

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Just took a look at a draft of the USGS centerline technical requirements document. This is a document describing the technical requirements that are being adopted for the National Map transportation edit. It lists some of the feature representation and feature accuracy standards that the USGS is trying to meet with the data that they are integrating from states, Census, and various other organizations.

Here are some more random observations that might be good to consider during the UTDM modernization effort this fall...that's not to say that we should adopt them...more just they should be considered.

- USGS has good language regarding representation of linear and curving features and the importance of preserving the character or centerline features (i.e. a 30 foot accuracy standard doesn't mean that vertices for a straight feature can be scattered within 30 feet of the physical road center as long as they are within 30 feet of the centerline location). "Coordinate density shall be suitable for viewing at 1:?? scale such that  curves do not appear to have angular geometry and straight runs will not appear to have angles"

- Business Routes (do we have any in Utah still?). My guess is that these are mostly relics of the bypassing of local businesses when the interstates were built...are they still signed and used. I'll check with UDOT on this.

- 100 foot 'cutback' for roads that run perpendicular to limited access highways in rural areas.

- Divided highways: represent as single line when division is less than 1 mile...this may change when USGS changes its focus to be more local road oriented.

- Collection of emergency/maintenance turn-arounds on limited access highways (my thought is no as these are available in the UDOT LRS as point locations and can be provided as such to the relevant users); collection and attribution of connector road where local road crosses a divided highway (many of these on Bangerter highway, south of 2100 South).

- Highway aliases ex. US89 in Davis County is the 'James V. Hansen Highway', Highway 95 in San Juan County is the 'Bicentennial Highway'. Are these worth carrying as attributes to anybody?

- Policy on lifecycle of street feature unique IDs

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## Re:Improving the Utah Transportation Data Model

Posted by James Wingate - 2009/08/06 16:51

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This is good info, Bert. I too like the USGS' wording about the placement of vertices. At Blue Stakes we have never received a call for a business loop or for a highway alias like the examples you cited. We get plenty of calls for "Highway 6" instead of "US 6" but I don't anticipate business loop or honorary highway alias names being needed for any mainstream use of street centerline data.

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